

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU2004/000914

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A. CLASSIFICATION OF SUBJECT MATTER Int. Cl. 7: C12N 1/20, A61K 35/74, A01N 63/02 According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) WPIDS, CAPLUS, AGRICOLA, MEDLINE: barley, wheat, actinomycete, actinobacteria, streptomyces, endoph?, propagat?, growth, production, biodegrad?		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
XY	SARDI, P. et al (1992) "Isolation of Endophytic <i>Streptomyces</i> strains from Surface Sterilized Roots" <i>Appl. Environ. Microbiol.</i> 58(8):2691-2693. See entire document and in particular Table 2	1-45
XY	Salleh A. Antibiotics for wheat. News in Science (online) 24/08/2001 (retrieved 9/08/2004). Retrieved from the Internet: available on web.archive.org 4 October 2001 URL: http://www.abc.net.au/science/news/stories/s351442.htm see entire document	1-45
Y	EL-SHANSHOURY, A. R. (1989) "Growth Promotion of Wheat Seedlings by <i>Streptomyces atroolivaceus</i> " <i>J. Agronomy & Crop Science</i> , 163:109-114. See entire document and particularly page 109 columns 1 and 2 - Introduction	1-45
PX	COOMBS, J. T. et al (Sept. 2003) "Isolation and Identification of Actinobacteria from Surface Sterilized Wheat Roots" <i>Appl. Environ. Microbiol.</i> 69(9):5603-5608. See entire document	1-45
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C <input type="checkbox"/> See patent family annex		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family	
Date of the actual completion of the international search 21 September 2004	Date of mailing of the international search report 30 SEP 2004	
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustalia.gov.au Facsimile No. (02) 6285 3929	Authorized officer PHILIPPA WYRDEMAN Telephone No : (02) 6283 2554	

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	COOMBS, J. T. et al (July 2003) "Visualisation of an Endophytic <i>Streptomyces</i> Species in Wheat Seed" <i>Appl. Environ. Microbiol.</i> 69(7):4260-4262. See entire document	1-45

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Box No. II Observations where certain claims were found unsearchable (Continuation of Item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.: **38 and it's dependencies in part**
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
Claim 38 and it's dependencies are directed to any metabolite derived from the microorganisms of the invention. The microorganisms claimed are likely to produce many metabolites that are common with all other related microorganisms and other non related microorganisms. These metabolites are clearly not encompassed within the inventive concept of this invention and as such claims to them are not supported. It is not possible to undertake a comprehensive search of all possible metabolites and their mimetics, chemical equivalents etc as claimed.

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
See extra sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-45 in so far as they relate to an endophytic actinomycete of the strain *Streptomyces triticum* and characterised by the nucleotide sequences <400>3, 7-10, 12-14, 17 and 19-30 and methods of using same.

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
☐ No protest accompanied the payment of additional search fees.

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Supplemental Box

(To be used when the space in any of Boxes I to VIII is not sufficient)

Continuation of Box No: III

The Applicant has claimed more than one invention. Rule 13.1 of the PCT states the principle that an International Application should relate to only one invention or, if there is more than one invention, that the inclusion of those inventions in one International Application is only permitted if all inventions are so linked as to form a single general inventive concept.

Rule 13.2 of the PCT defines the method for determining whether the requirement of unity of invention is satisfied in respect of a group of inventions claimed in an International application. Unity of invention exists only when there is a technical relationship among the claimed inventions involving one or more of the same or corresponding "special technical features." The expression "special technical features" is defined in Rule 13.2 as meaning those technical features that define a contribution which each of the inventions, considered as a whole, makes over the prior art. The determination is made on the contents of the claims as interpreted in light of the description and drawings (if any).

Invention 1 : An endophytic actinomycete of the strain *Streptomyces triticum* and characterised by the nucleotide sequences <400>3, 7-10, 12-14, 17 and 19-30 and methods of using same.

Invention 2 : An endophytic actinomycete of the species *Nocardioides albus* and characterised by the nucleotide sequence <400> 16 and methods of using same.

Invention 3 : An endophytic actinomycete of the species *Streptomyces galilaeus* and characterised by the nucleotide sequence <400> 2 and 15 and methods of using same.

Invention 4 : An endophytic actinomycete of a species of *Streptomyces* and characterised by the nucleotide sequence <400> 11 and methods of using same.

Invention 5 : An endophytic actinomycete of the species *Streptomyces argenteolus* and characterised by the nucleotide sequence <400> 18 and methods of using same.

Invention 6 : An endophytic actinomycete of the species *Microbispora* and characterised by the nucleotide sequence <400> 1 and methods of using same.

Invention 7 : An endophytic actinomycete of the species *Streptomyces pseudovenezuelae* and characterised by the nucleotide sequence <400> 4 and methods of using same.

Invention 8 : An endophytic actinomycete of the species *Streptomyces lincolnesis* and characterised by the nucleotide sequence <400> 5 and methods of using same.

Invention 9 : An endophytic actinomycete of the species *Streptomyces bikiniensis* and characterised by the nucleotide sequence <400> 6 and methods of using same.

Each of the above organisms are endophytic actinomycetes that are capable of improving plant productivity, but this is not novel, as noted in the following citation. Therefore this cannot be used as a special technical feature providing unity to all of the sequences.

Salleh A. Antibiotics for wheat. News in Science (online) 24/08/2001 (retrieved 9/08/2004). Retrieved from the Internet: <URL:<http://www.abc.net.au/science/news/stories/s351442.htm>>

In order to search each of the inventions, this could only be done by consideration of each of the individual organisms, thereby requiring eight separate searches. Thus, each of the organisms is considered as a single invention.